Tri-Lube Grease Pump Package User Manual

Tri-Lube Grease Pump Package

PROVEN QUALITY. LEADING TECHNOLOGY.

TABLE OF CONTENTS

SECTION/PARAGRAPH		PAGE
1.0	**INTRODUCTION**	
1.1	GENERAL	1-1
1.2	SAFETY INSTRUCTIONS	1-1
1.3	DESCRIPTION	1-1
1.4	OPERATION	1-2
2.0	**INSTALLATION**	
2.1	MOUNTING	2-1
2.2	WIRING	2-1
2.3	FILLING RESERVOIR	2-2
2.4	PURGING AIR FROM PUMP	2-2
2.5	ADDING PUMP ELEMENTS	2-3
2.6	PUMP ADJUSTMENTS	2-3
3.0	**SERVICE AND REPAIR**	
3.1	REQUIRED TOOLS	3-1
3.2	REPLACING COVER, LL & FOLLOWER	3-1
3.3	REPLACING RESERVOIR	3-2
3.4	REPLACING ECCENTRIC SHAFT BEARING	3-2
3.5	REPLACING CAM ASSEMBLY	3-2
3.6	REPLACING DC GEARMOTOR	3-3
3.7	REPLACING AC MOTOR	3-4
4.0	**PARTS LISTS**	**4-1 THRU 4-3**
5.0	**TROUBLESHOOTING**	**5-1**

LIST OF ILLUSTRATIONS

NUMBER	TITLE	PAGE
1-1	PUMP OPERATION	1-2
2-1	PUMP DIMENSIONS	2-1
2-2	ELECTRICAL DIAGRAMS	2-1
2-3	TYPICAL PUMP PACKAGE	2-2
2-4	ADD PUMP ELEMENTS	2-2
2-5	RELIEF VALVE ADJUSTMENT	2-3
2-6	OUTPUT ADJUSTMENT	2-3
3-1	RESERVOIR COVER	3-1
3-2	RESERVOIR & FOLLOWER	3-1
3-3	RESERVOIR & PADDLE	3-2
3-4	RESERVOIR & BEARING	3-2
3-5	ECCENTRIC	3-2
3-6	DC MOTOR COVER	3-3
3-7	DC MOTOR LEADS	3-3
3-8	MOTOR ATTACH SCREWS	3-3
3-9	PUMP DISASSEMBLED	3-3
3-10	AC MOTOR & REDUCER	3-4
3-11	AC MOTOR	3-4
4-1	DC PUMP PARTS	4-1
4-2	AC PUMP PARTS	4-2
4-3	11 LB RESERVOIR PARTS	4-3

LIST OF TABLES

NUMBER	DESCRIPTION	PAGE
2-1	OUTPUT ADJUSTMENT	2-3
4-1	DC PUMP PARTS LIST	4-1
4-2	AC PUMP PARTS LIST	4-2
4-3	11 LB RES. PARTS LIST	4-3

OPERATION AND SERVICE INSTRUCTIONS

SECTION 1

INTRODUCTION

1.1 GENERAL 1-1
1.2 SAFETY INSTRUCTIONS 1-1
1.3 DESCRIPTION 1-1
1.4 OPERATION 1-2

1.1 GENERAL

1.1.1 This User Manual is intended to familiarize the user with the Tri-Lube grease pump and its various features. It contains important information for safe, correct and economical operation of the grease pump. Following the instructions will help avoid hazards, reduce downtime and repair costs, increase the reliability and prolong the service life of the entire system.

1.1.2 This User Manual must be read and used by those who will work with the complete lubrication system.

1.1.3 Other useful Graco/Trabon Bulletins are:

a. Bulletin 40000 – Series Progressive System Installation Guide.

b. Bulletin 30103 – How to Remove Air from a Series Progressive System.

c. Bulletin 30101 – How to locate Blockage in a Series Progressive System.

1.2 SAFETY INSTRUCTIONS

a. Read all of the applicable instructions before operating your lubrication system.

b. Keep all operating instructions near system for future reference.

c. Incorrect use or unauthorized system changes may result in bearing damage caused by under or over lubrication.

d. Any existing safety equipment must not be modified when attaching the lubrication pump and system to the machine.

e. If any safety equipment is removed to allow mounting of the lubrication pump or system, it must be re-assembled prior to machine and/or lubrication system operation.

f. Keep lubrication system away from any high heat source.

g. Disconnect and lock out electrical power source before attempting any repairs to the Tri-Lube Pump Package.

h. Use only original replacement parts.

1.3 DESCRIPTION

1.3.1 All Tri-Lube Pump Packages consist of the following components:

a. A reservoir for holding the lubricant. Reservoirs are cylindrical in shape and are made from transparent plastic or metal depending on the specific model. Each reservoir is equipped with a low level switch activated by the follower assembly and a rotating paddle to assist priming of the pump.

b. A pump element is available with either a fixed or adjustable output. All pump elements are equipped with an adjustable relief valve that relieves to atmosphere. A second or third pump element can be added in the field to supply additional output volume or additional lube points where required.

c. A gearmotor (12 or 24 VDC) or a motor and gear reducer (115 or 230 VAC, 1 ph, or 230/460 VAC, 3 ph) which drives the pump.

d. A pump body which houses the pump drive eccentric and to which all other components are attached.

1.4 OPERATION

1.4.1 **Figure 1-1** shows the general relationship of the pump element and the drive eccentric. The following steps outline the operating sequence:

a. Grease in the reservoir keeps the pump body full during normal operation and maintains a head pressure to accomplish two objectives.

- Provide constant lubrication to the moving pump components.
- Supply lubricant to the piston chamber in the pump cylinder.

b. A rotating cam (Item 1) forces the pump piston (Item 2) forward displacing lubricant from the pump cylinder, past an internal discharge check valve and out of the pump outlet.

c. As the cam (Item 1) continues to rotate, the pull-back ring (Item 3) pulls the pump piston (Item 2) back to the prime position allowing grease to re-prime the piston chamber for the next stroke. Also attached to the eccentric shaft is a paddle (not shown) with an angled surface that forces grease into the pump chamber as it rotates and also aids in dispersing any small air pockets that might be present in the grease.

Fixed Pump Element

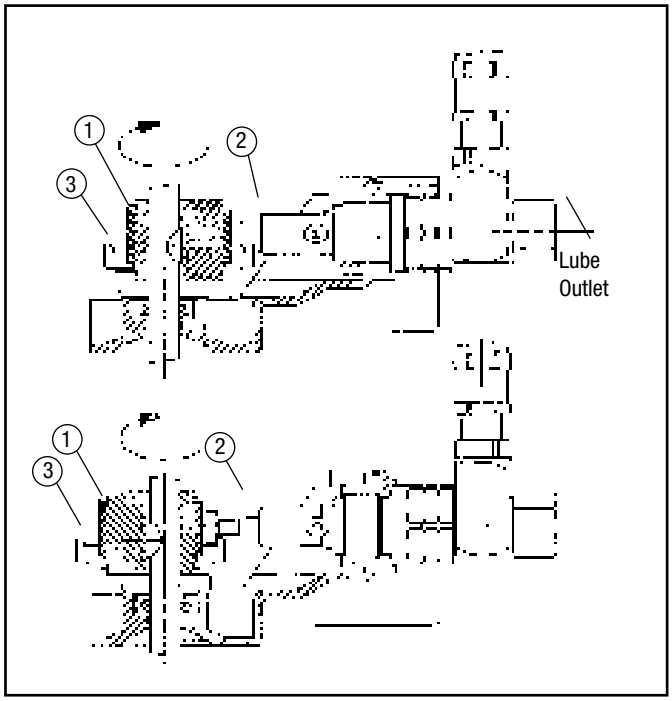

Figure 1-1

OPERATION AND SERVICE INSTRUCTIONS

SECTION 2

INSTALLATION

2.1 MOUNTING 2-1
2.2 WIRING 2-1
2.3 FILLING RESERVOIR 2-2
2.4 PURGING AIR FROM PUMP 2-2
2.5 ADDING PUMP ELEMENTS 2-3
2.6 PUMP ADJUSTMENTS 2-3

2.1 MOUNTING THE PUMP

2.1.1 The pump should be mounted in a vertical position with the reservoir at the top and in a protected location, but where it is accessible for filling and routine maintenance.

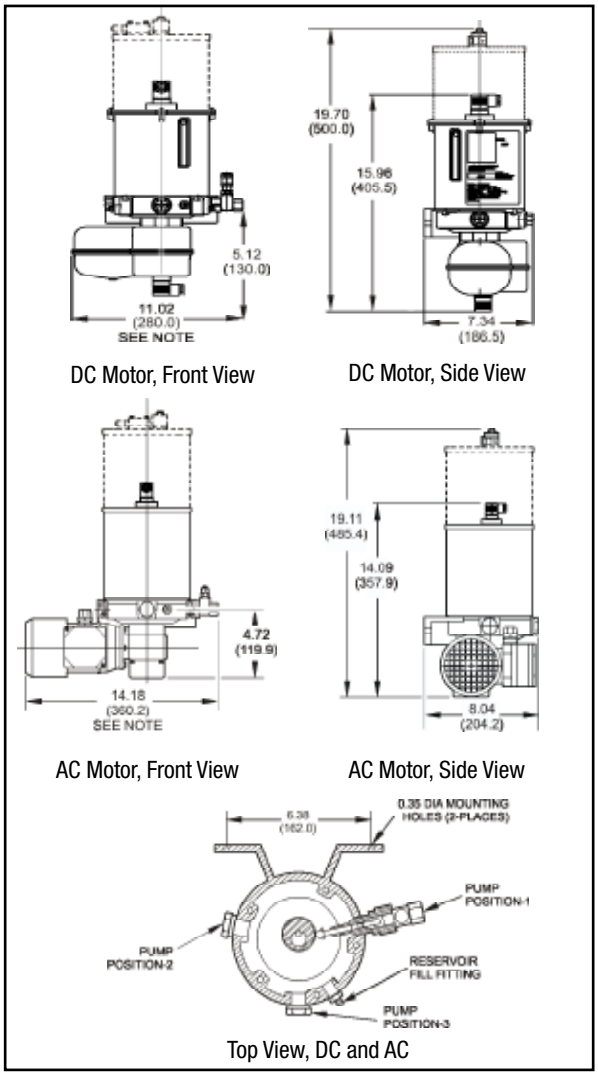

Figure 2-1

2.1.2 The pump is mounted using two 5/16" or two 8 mm bolts (furnished by user) that pass through the mounting feet on the pump body. The mounting bolt length will depend on the thickness of the mounting surface and whether the holes are to be tapped for the bolts or locked in place with nuts and washers. Mounting dimensions are shown in **Figure 2-1**

2.2 WIRING THE PUMP

2.2.1 Electrical connections are shown in **Figure 2-2**

2.2.2 Wiring to the AC motors should be 16 AWG stranded wire with insulation rated for 300 V max and 105ºC.

2.2.3 The DC pump motors and all low level switches may be wired with 18 AWG stranded wire cable.

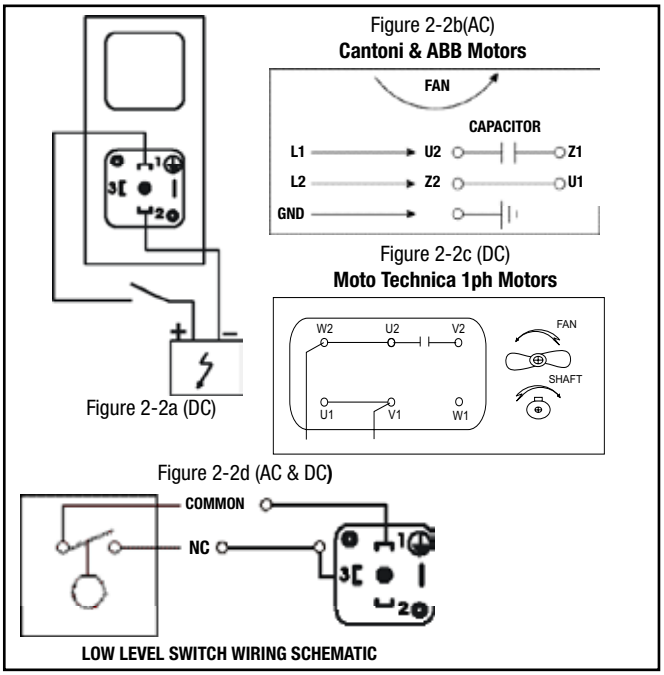

Figure 2-2

2.3 FILLING THE RESERVOIR

2.3.1 The reservoir should be filled with clean air free grease of the type recommended by the machine builder and having an NLGI grade number consistent with the ambient operating temperature of the equipment **(grease must be pumpable at the lowest anticipated operating temperature).**

CAUTION

Do not fill the reservoir with grease heavier than NLGI #2. For temperatures below -5^{0}F (-20^{0}C), use NLGI #1 or lighter grease.

2.3.2 Filling is accomplished by connecting a suitable transfer pump to the fill fitting in the front of the pump housing (See **Figure 2-3**). Before connecting the transfer pump, make sure that both the lube fitting and the coupler are clean and that the hose and transfer pump are full of clean grease that is free of air.

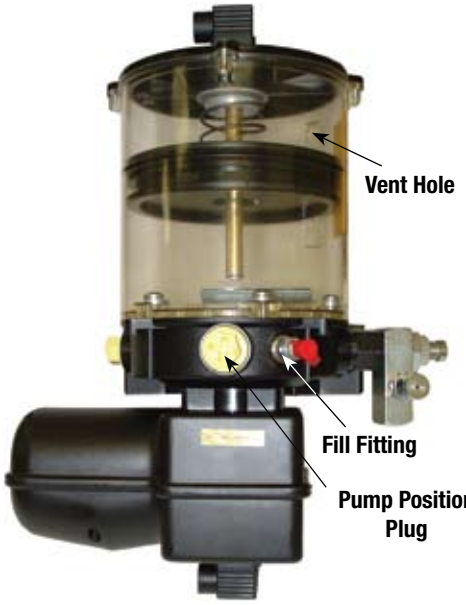

Figure 2-3

2.3.3 For the initial filling, or if the reservoir has been allowed to run dry, removing one of the pump position yellow plugs from the pump body will facilitate expelling air from the body and reservoir. Slowly start to fill the reservoir until grease free of air flows from the open pump position. At this point, stop the transfer pump and re-install the yellow plug. After the plug is installed, fill slowly until the follower seal is slightly above the vent hole in the reservoir tube. This will allow air remaining below the follower to escape. When grease free of air is seen at the vent, stop filling.

2.3.4 For subsequent re-filling, unless the reservoir has been allowed to run dry or air was pumped into the reservoir, it will not be necessary to remove the yellow plug or fill above the vent hole.

2.4 PURGING THE PUMP AND SYSTEM OF AIR

2.4.1 Operate the pump with the main line disconnected until grease free of air is seen at the pump outlet.

2.4.2 Fill and purge system lines and divider valves following the procedures outlined in Trabon Bulletin L30103.

2.4.3 Once all lines and dividers have been purged free of air, reconnect pump to mainline.

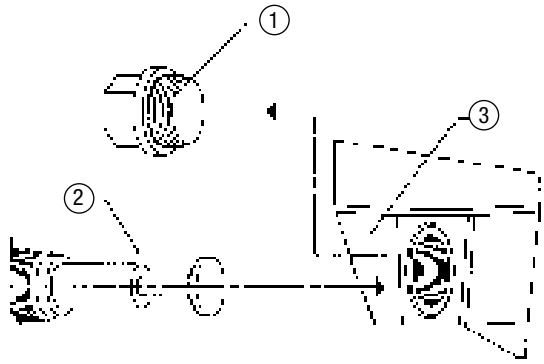

Figure 2-4a

Figure 2-4b

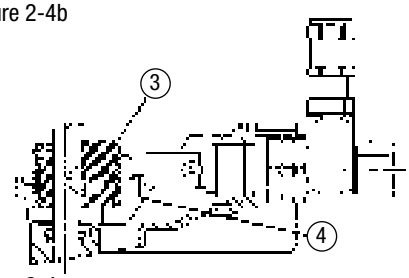

Figure 2-4c

Figure 2-4

2.5 ADDING PUMP ELEMENTS

CAUTION

To avoid personal injury or severe internal damage to the drive-train, or pump element, these procedures must be followed carefully.

2.5.1 Disconnect power to the pump motor.

2.5.2 Remove sealing plug 1 (**figure 2-4a**).

2.5.3 Pull out pump piston 2 until it extends approximately 1-1/8" (29 mm) from end of cylinder to end of mushroom head.

2.5.4 Insert element into housing at approximately a 15 degree angle as shown in **figure 2-4b**.

NOTE: If pump is full of grease, it will be necessary to clear a path through the grease using a clean screwdriver.

2.5.5 Rotate element down (**figure 2-4c**) engaging mushroom head between cam 3 and retracting ring 4.

2.5.6 Tighten element 18-22 fl-lbs (25-30 N-m). Do not over torque as housing threads will be stripped.

2.5.7 Fill reservoir with clean grease (**See Section 2-3**) and run pump for 1 minute to check for grease output. If none is seen, it could indicate that the element was not properly installed.

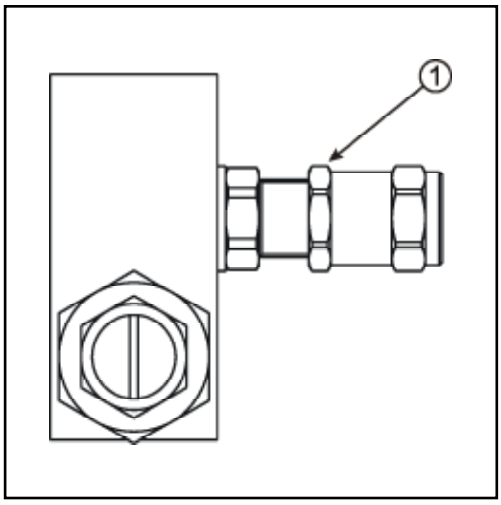

Figure 2-5

2.6 PUMP ADJUSTMENTS

2.6.1 **Adjusting the Relief Valve.** Each pumping element incorporates an adjustable relief valve to protect the system against overpressure. The relief setting can be adjusted by loosening the locking nut (1) (See **Figure 2-5**) and turning the cap clockwise to increase the relief pressure, and counterclockwise to decrease the relief pressure, as required by the system application.

CAUTION

Do not adjust above 2900 psi (200 bar) for DC pumps or 5075 psi (350 bar) for AC pumps as pump or motor damage may result.

2.6.2 **Pump Output Adjustment**. The nominal delivery rate of the pumping element can be adjusted by loosening the locking nut (1) (See **Figure 2-6**) and rotating the adjustment screw (2)clockwise to reduce delivery, or counterclockwise to increase delivery of the lubricant. The output adjustment table describes the equivalent outputs that can be obtained by varying the distance "A" of the adjustment screw. (See Table 1)

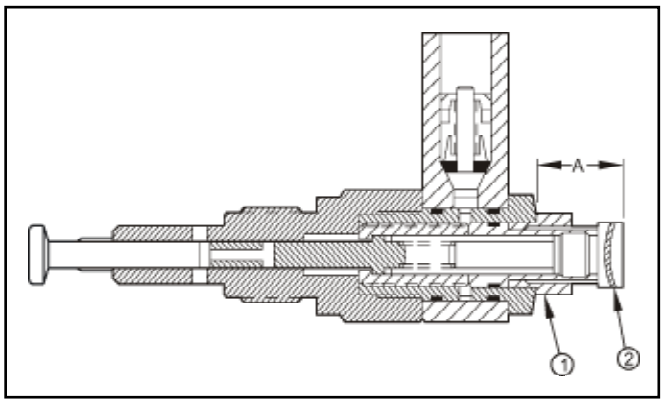

Figure 2-6

OPERATION AND SERVICE INSTRUCTIONS

SECTION 3

SERVICE AND REPAIR

3.1 REQUIRED TOOLS 3-1
3.2 REPLACING COVER, LOW LEVEL & FOLLOWER 3-1
3.3 REPLACEMENT RESERVOIR.....3-2
3.4 REPLACING ECCENTRIC SHAFT BEARING 3-2
3.5 REPLACING ECCENTRIC & PISTON RETRACT RING.....3-2
3.6 REPLACING DC GEARMOTOR 3-3
3.7 REPLACING AC MOTOR 3-4

3.1 REQUIRED TOOLS

3.1.1 The following standard hand tools plus a vice with padded jaws are required for disassembly and repair of the Tri-Lube Pump Package.

a. Number 2 and 3 Phillips Screwdrivers (#3 must have a long blade).

b. 4 mm Allen Wrench.

c. 8 mm Open End Wrench.

d. 27 mm Open End wrench.

e. 3/8 in Ratchet Wrench and Extensions.

f. 3/8 in drive 17 mm Socket.

3.2 REPLACING LOW LEVEL SWITCH, RESERVOIR COVER AND FOLLOWER ASSEMBLY (SEE FIG. 3.1 & 3.2)

NOTE: Replacement Low Level Switches are available as part of a Low Level Switch/Cover/Follower Assembly only.

3.2.1 Remove four cover screws.

3.2.2 With slight rocking motion of cover, withdraw follower/ low level switch assembly from reservoir.

3.2.3 If suction below follower cannot be broken by rocking motion, remove one or more pump position plug.

3.2.4 Reassemble in reverse order.

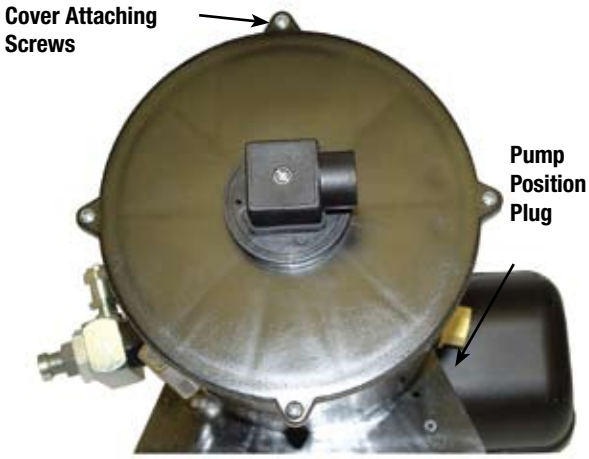

Figure 3-1

Figure 3-2

3.3 REPLACING RESERVOIR (SEE FIG 3.3 & 3.4)

3.3.1 Following removal of reservoir cover and follower assembly as outlined in 3.2 above, remove any grease using a clean scoop and clean rags.

3.3.2 Remove paddle retaining nut. Note: nut and shaft have left hand threads.

3.3.3 Remove paddle drive adapter (adapter and shaft have left hand threads).

3.3.4 Remove five reservoir to pump body attaching screws from inside reservoir.

3.3.5 Remove reservoir from pump body. Note: If eccentric shaft bearing will be reused and remains in old reservoir, remove it from the old reservoir bearing cavity (bearing is a light push fit in cavity).

3.3.6 Reassemble in reverse order.

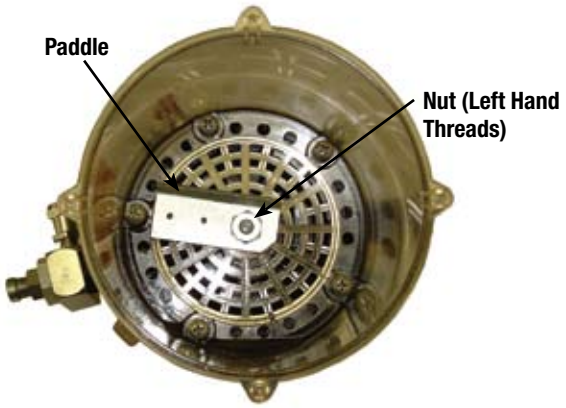

Figure 3-3

3.4 REPLACING ECCENTRIC SHAFT BEARING (SEE FIG 3-4)

3.4.1 Following removal of the reservoir as described in 3.3 above, the bearing will either be on the eccentric shaft or in the bearing cavity of the reservoir (bearing is a lightpush fit in both components). Remove the old bearing and check both the eccentric shaft and the bearing cavity for scoring.

a. If none is found, the new bearing may be installed in the bearing cavity.

a. If scoring in either location is found it may be possible to clean up the surface with fine (600 grit) wet or dry paper.

a. If severe, or if the scoring cannot be cleaned up replace the damaged components along with the bearing.

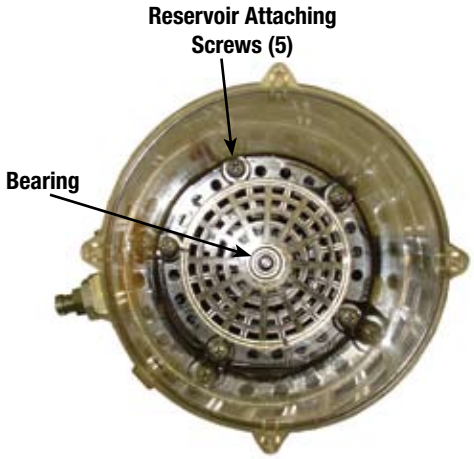

Figure 3-4

3.5 REPLACING ECCENTRIC AND PISTON RETRACT RING (SEE FIG 3-5)

3.5.1 Following removal of the reservoir cover and the reservoir as outlined in 3.2 & 3.3 above, remove spacer from eccentric shaft. Note: If pump element was not previously removed, remove it now following the instructions in Section 2.5.

3.5.2 Eccentric and retract ring can now be slipped off eccentric shaft as a unit.

NOTE: Do not attempt to disassemble eccentric from retract ring as individual repair parts are not available.

3.5.3 Reassemble in reverse order.

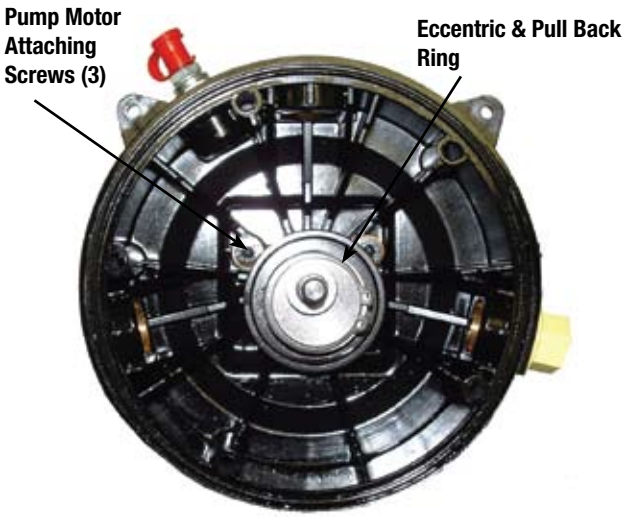

Figure 3-5

3.6 REPLACING DC GEARMOTOR (SEE FIG 3-6, 3-7, 3-8 & 3-9)

3.6.1 Following removal of the reservoir cover, reservoir and eccentric assembly as outlined in 3.2, 3.3 and 3.5 above, remove key from eccentric shaft.

3.6.2 Remove spacer from shaft.

3.6.3 Invert pump unit and remove eight retaining screws from lower motor housing. Separate lower housing from upper housing.

3.6.4 Cut motor leads approximately 3 in from old gearmotor.

3.6.5 Remove lower housing leaving leads in place and set aside.

3.6.6 Remove three motor attaching screws with copper washers from inside pump housing.

3.6.7 Separate pump housing, upper motor housing and gearmotor using care to avoid damaging the eccentric shaft seal.

3.6.8 Make sure replacement gearmotor is correct voltage (24 VDC or 12 VDC).

3.6.9 Trim new gearmotor leads to approximately 3 in length and strip ¼ in insulation from each lead

3.6.10 Strip ¼ in of insulation from mating power leads. Use wire nuts or crimp type wire connectors to splice leads making sure that red is connected to red and blue to blue.

3.6.11 Reassemble in reverse order.

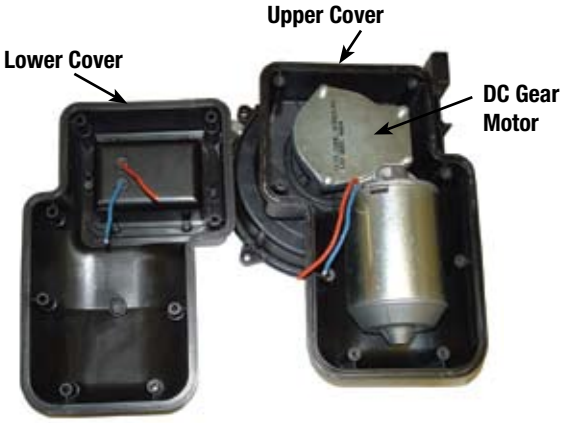

Figure 3-7

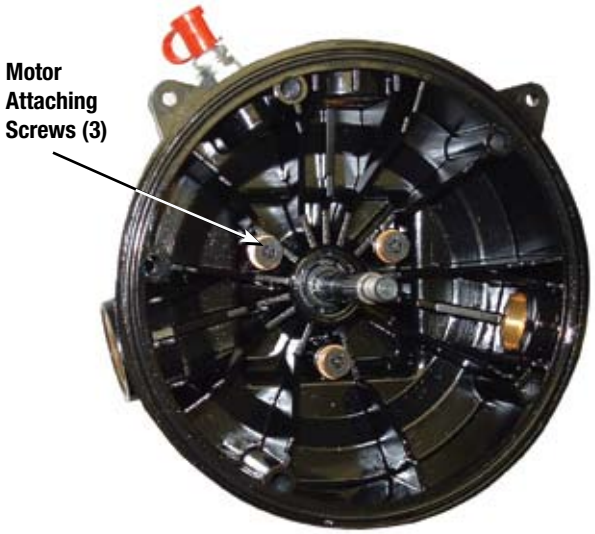

Figure 3-8

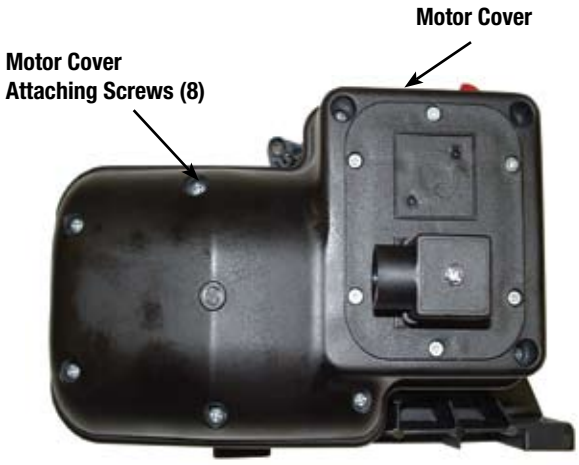

Figure 3-6

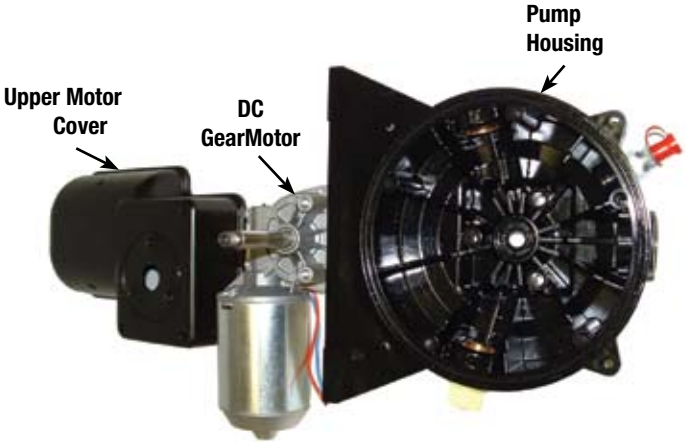

Figure 3-9

3.7 REPLACING AC MOTOR (SEE FIG'S 3-10 & 3-11)

3.7.1 Turn off power to motor.

3.7.2 Remove cover from motor conduit box.

3.7.3 Tag motor leads and remove from terminals.

3.7.4 Remove four motor mounting bolts that attach motor to gear reducer.

3.7.5 Slide motor shaft with key out of hollow input shaft of gear reducer.

3.7.6 Reassemble in reverse order making sure that key is aligned with keyway in hollow input shaft of gear reducer.

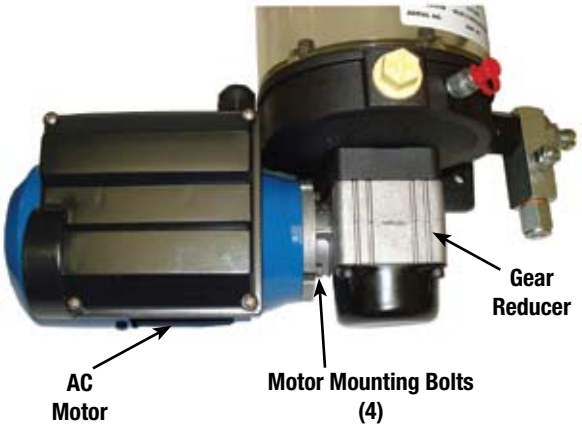

Figure 3-10

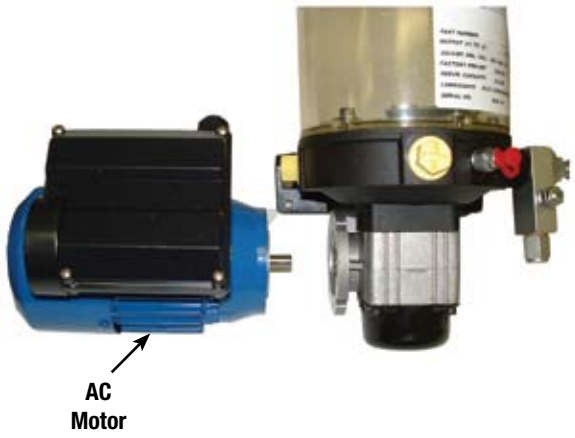

Figure 3-11

OPERATION AND SERVICE INSTRUCTIONS

SECTION 4

PARTS LIST

4-1 DC PUMP PACKAGE-4.4 LB (2 KG) RESERVOIR 4-1
4-2 AC PUMP PACKAGE-4.4 LB (2 KG) RESERVOIR 4-2
4-3 11 LB (5 KG) RESERVOIR..... 4-3

DC PUMP PACKAGE – 4.4 LB (2 KG) RESERVOIR ORDERING INFORMATION

Item	Description	Quantity	Part No.	Old Part No.
1	Switch, LL, Cover, Follower 4.4 Lb (2 Kg)	1	–	529-905-111
2	Reservoir, 4.4 Lb (2 Kg), Plastic	1	Disc	529-905-053
8	O-Ring, Reservoir to Body Seal	1	–	529-905-083
11	Eccentric Assembly (All DC Units)	1	–	529-905-084
13	Seal, 22 x 10 x 7 mm	1	–	529-905-058
14	Gearmotor 24 VDC	1	558943	529-905-060
15	Gearmotor 12 VDC	1	–	529-905-059
18	Bearing, S.R. Ball, 26 x 10 x 8 mm	1	–	529-905-055
20	Plug, Pump Position	2	–	529-905-068
22	Fill Fitting (1/8 GMH)	1	–	529-905-086
23	Element, Pump, Fixed	1-3	558944	529-905-090
24	Element, Pump, Adjustable	1-3	558945	529-905-100
27	Connector, Electrical with Cover	1	–	529-905-115
28	O-Ring, Cover Seal	1	–	529-905-052
29	O-Ring, Follower Rod Seal	1	–	529-905-066
30	O-Ring, Follower Plate Seal	1	–	529-905-065
31	Upper Gearmotor Cover	1	–	529-905-087
32	Lower Gearmotor Cover	1	–	529-905-088

Table 4-1

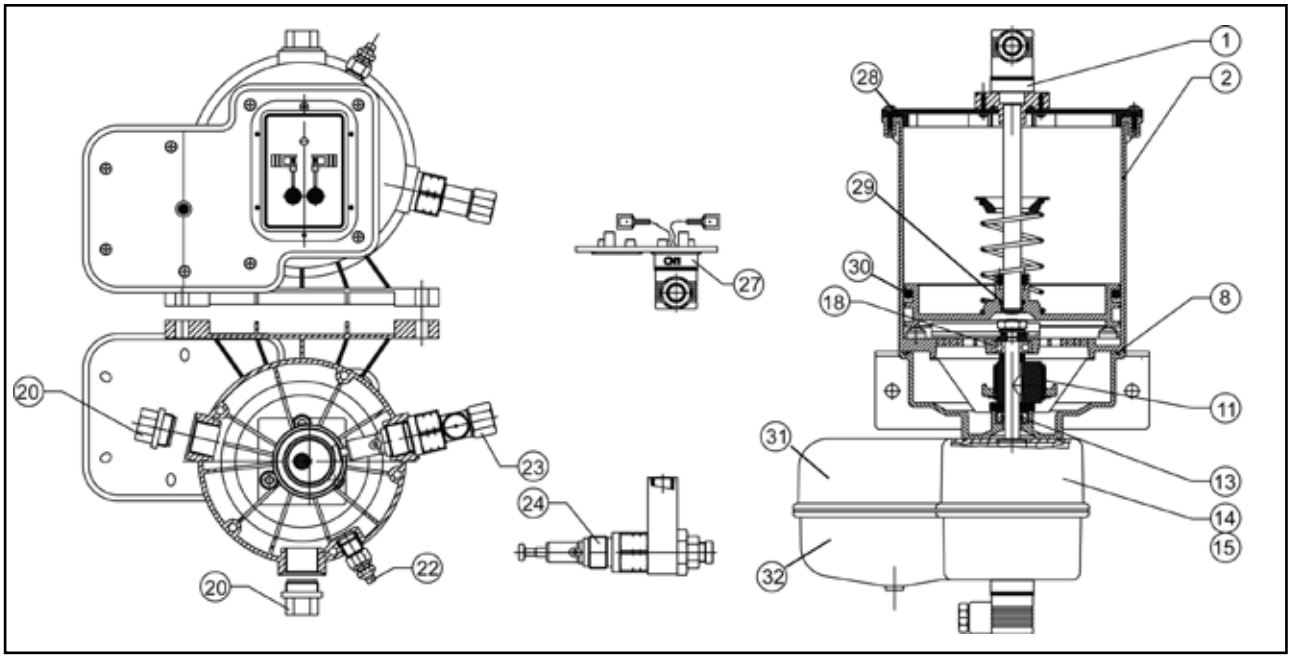

Figure 4-1

AC PUMP PACKAGE – 4.4 LB (2 KG) RESERVOIR ORDERING INFORMATION				
Item	**Description**	**Quantity**	**Part No.**	**Old Part No.**
1	Switch, LL, Cover, Follower 4.4Lb (2Kg)	1	–	529-905-111
2	Reservoir, 4.4 Lb (2 Kg. Plastic)	1	Disc	529-905-053
7	O-Ring, Reservoir to Body Seal	1	–	529-905-083
10	Eccentric Assembly (4.4lb, AC)	1	–	529-905-084
10	Eccentric Assembly (11 lb, AC)	1	–	529-905-085
12	Seal, 22 x 10 x 7 mm	1	–	529-905-058
16	Reducer, Gear, 80:1	1	–	529-905-089
20	Bearing, S.R. Ball, 26 x 10 x 8 mm	1	–	529-905-055
24	Motor, 230/460 VAC, 3 ph	1	–	529-905-082
25	Motor, 115 VAC, 1 ph	1	556011	126-410-000
26	Motor, 230 VAC, 1 ph	1	556012	126-410-001
29	Element, Pump, Fixed	1-3	558944	529-905-090
30	Element, Pump, Adjustable	1-3	558945	529-905-100
32	Fill Fitting (1/8 GMH)	1	–	529-905-086
33	Plug, Pump Position	2	–	529-905-068

Table 4-2

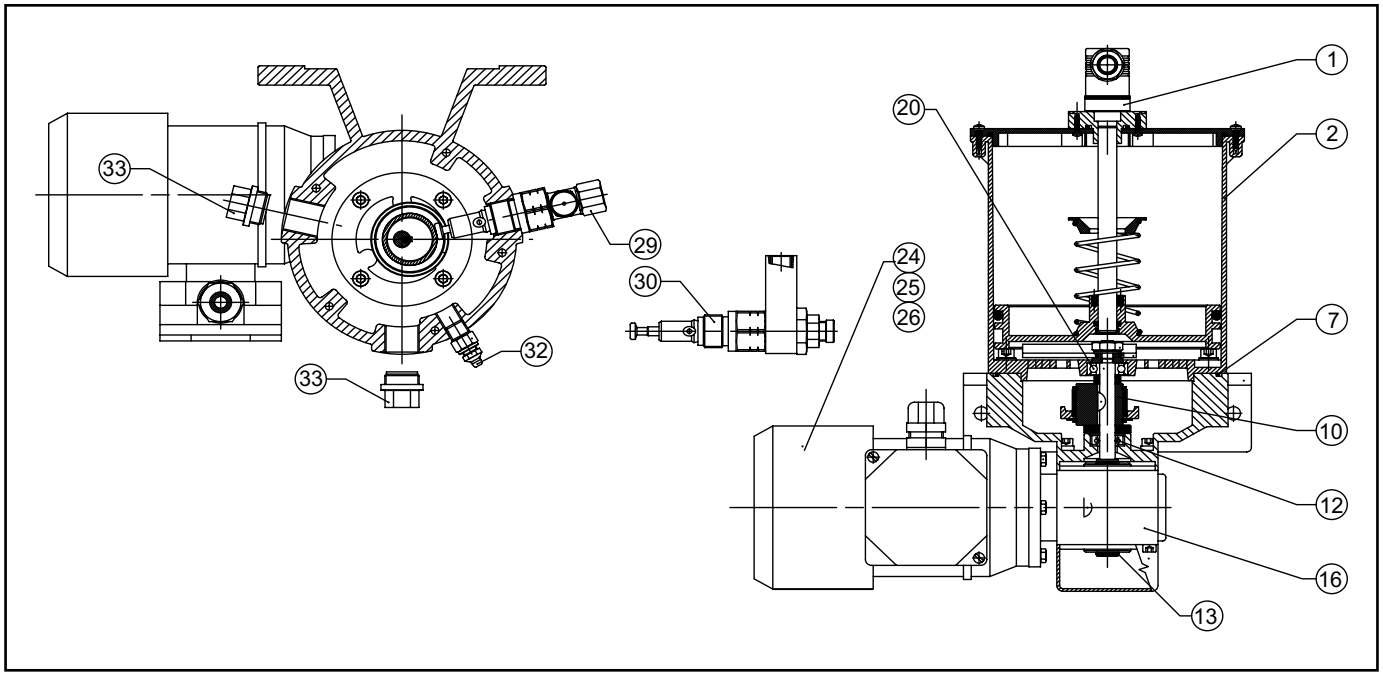

Figure 4-2

11 LB (5 KG) RESERVOIR				
Item	**Description**	**Quantity**	**Part No.**	**Old Part No.**
2	Switch, Low Level	1	–	529-905-071
6	Cover	1	–	529-905-072
7	Reservoir	1	–	529-905-073
9	Seal, Follower Rod	1	–	529-905-074
10	Seal, “V”, Follower	1	–	529-905-076
15	Gasket	1	–	529-905-080
24	Follower	1	–	529-905-075

Table 4-3

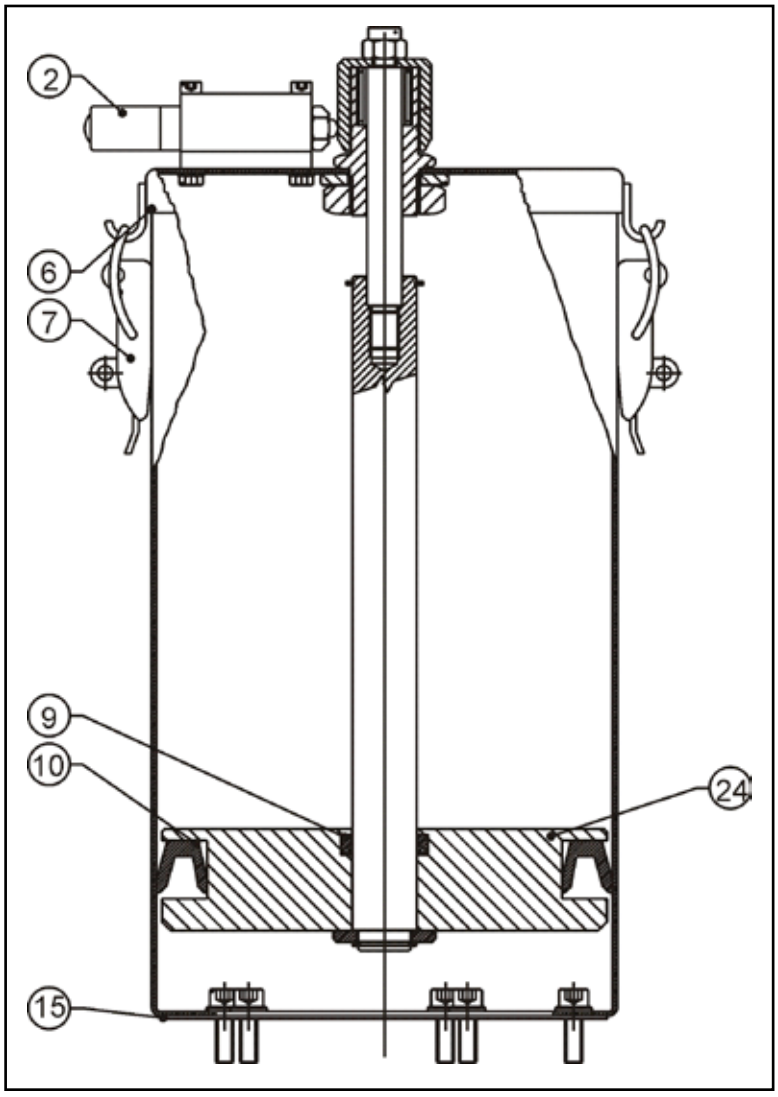

Figure 4-3

OPERATION AND SERVICE INSTRUCTIONS

SECTION 5

TROUBLESHOOTING

5.1 PUMP DOES NOT PRODUCE FLOW 5-1
5.2 LL SWITCH DOES NOT SIGNAL LL 5-1

5.1 PUMP DOES NOT PRODUCE FLOW

5.1.1 Make sure that reservoir contains an adequate supply of air free grease that is pumpable at the operating temperature being encountered.

a. If reservoir is empty, refill following the instructions in **section 2.3** and purge pump free of air.

b. If grease is too heavy for the temperature conditions, empty reservoir and refill with grease of the correct NLGI grade number (refer to **section 2.3**).

c. If grease contains air pockets and pump is air bound, empty reservoir and refill with grease that is free of air (refer to **section 2.3**).

5.1.2 On adjustable pumps, make sure the output adjustment is not set to minimum (refer to **section 2.6.2**).

5.1.3 Make sure that power of correct voltage is being supplied to motor and that motor is operating.

a. If power is not present, check fuses and wiring and correct any problems found (refer to **section 2-2**).

a. If power is present and motor does not operate, remove pump element (Refer to **section 2-5**) and check for motor operation.

a. If motor still does not operate, replace motor (refer to **section 3-4 and 3-5**).

a. If motor operates, check for bent or binding components (pump piston and cylinder, cam and retract ring or gear reducer). Replace any damaged components (refer to **sections 3.3, 3.4 and 3.5**).

5.2 LOW LEVEL SWITCH DOES NOT SIGNAL LOW LEVEL

5.2.1 Make sure that level switch is properly wired (see **figure 3-1**) and correct any problems found.

5.2.2 Make sure that the follower tracks the drop in grease level to the bottom of the reservoir.

a. If follower appears stuck in reservoir at mid travel, there is most likely a pocket of air between the bottom of the follower and the top of the grease column. Purge air pocket by filling reservoir until follower is just above vent hole in reservoir side wall and grease free of air is seen at vent (refer to **section 2.3**).

a. If follower tracks fall of grease level and switch does not signal, replace Level/Switch/Cover/Follower assembly (refer to **section 3.1**).

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